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Cover Photo:
Wool carpet
Central Caucasus, 17th or 18th century
Acquired by George Hewitt Myers in 1916
TM R36.1.1
195 in (warp) x 93 in (weft)

A classic "dragon" carpet with two-tiered lattice of paired lanceolate leaves enclosing addorsed pairs of dragons and lotus blossoms. Scattered in pairs are stylized lions, ducks, pheasant, and mythical beasts with palmette blossoms and sunbursts placed at points of intersection.

Note to Contributors:

The Textile Museum Journal is devoted to the presentation of scholarship concerning the cultural, technical, historical, and aesthetic significance of textiles. The journal is international in scope with emphasis on geographic areas represented in The Textile Museum's collections: Near East, Central, South, and Southeast Asia, and South and Central America.

Authors are invited to submit manuscripts based on original research of a documentary, analytical, or interpretive nature. Articles should be both scholarly and accessible to the public.

For further information, write to Journal Coordinator, *The Textile Museum Journal*, 2320 'S Street, NW, Washington, D.C. 20008

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Compensation For Loss in Oriental Rugs: Traditional Methods and Passive Fills

by Sara Wolf Green
and Julia B. Swetzoff

From a conservator's most conservative viewpoint, the only important reason to compensate for loss in a textile is to provide greater stability to the object. The visual effect of the fill may be of secondary importance. However, even the most basic compensation for loss, a simple fabric patch applied with stitches, can markedly enhance the visual appreciation of even a severely deteriorated fabric, provided that the patch matches the textile closely in both texture and color.

The aesthetic impact of a plain fabric patch on either a flatweave or pile rug is significantly less effective than on a textile which has less texture and thickness. This problem of aesthetics prompted the research and development of a technique which would adequately support and stabilize as well as provide visual compensation for loss in pile and flatwoven rugs.

This research project was begun by interviewing rug restorers, dealers, and collectors about traditional restoration techniques.¹ One of the most important sources of information on historic treatments was the rug collection of The Textile Museum. A detailed survey of more than 800 rugs provided data to evaluate the success of various treatments in meeting the criteria of support, stabilization, and visual appeal.

The types of loss that had been treated

fell into two different categories: (1) loss of pile, and (2) loss of structural elements (warp and/or weft). Six repair techniques were identified:

- (1) Reknotting with the insertion of a partial or complete new foundation;
- (2) Embroidery techniques ("kashmiring" and darning);
- (3) Inserting a carpet patch cut from a second carpet ("plugging");
- (4) Patching with fabric attached from the back using needle and thread;
- (5) Patching with fabric or with plugs using adhesive or latex;²
- (6) A complete lining attached to the back of a rug with couching stitches used to stabilize loose elements either to patches or to the lining itself (techniques similar to traditional tapestry repair).³

Books and articles written in the early 20th century, such as "The Romance of the Oriental Rug," take an idealized view of rug production:

To the young Oriental Girl, whether a daughter of a fierce fighting Kurd, a village maiden or a nomad of a wandering tribe following peacefully flocks of sheep from hillside to hillside, the making of a rug is always more or less a matter of sentiment and love. Like the pair of baby socks a grandmother knits for the comfort of the grandchild, every stitch is a work of affection, a labor that brings joy to the maker and benefit to others.⁴

The contemporary approach to repair and restoration is quite pragmatic and focuses on extending the useable life of the carpet on the floor.⁵ While the commercial choice of repair technique has often been one of economy, the treatment of preference by collectors of valuable rugs has always been that of reweaving. This preference is clearly indicated in a letter dated 1950 from Beshir Galleries in New York to George Hewitt Meyers, the founder of The Textile Museum:

After considerable inquiry and investigation I have come to the conclusion that it is not going to be very satisfactory to undertake to put your large Chinese rug in condition by patching. It is impossible, because of the unique

character of your rug, to find old pieces for patching that are of anything like the same thickness and appearance. Also the painting and retouching involved would be very uneven and disfigured. Even such a patchwork job would cost between \$700. and \$800. and the rug would not come out attractively saleable.

I would recommend that, despite the somewhat greater cost, the rug be repaired by reweaving. This would put it in excellent condition, make it uniform, and minimize any appearance of repair. I have had experts examine the rug and they agree with me about this. The very best work would not cost more than \$1600. to \$2000. Since the rug is so valuable, the investment in a proper repair job by reweaving would be more than absorbed in the sale price. It would be saleable in a way which, patched up, it would never be.⁶

Historic Repair Techniques

The replacement of pile by means of embroidery stitches can be characterized by the commercial term "kashmiring" (fig. 1). Kashmiring is usually a flat embroidery stitch⁷ which is used to fill in areas of color where the structure is sound, but where exposed warps or wefts detract from the overall aesthetic of a rug. Kashmiring is most frequently used on rugs where the pile is worn extremely short and even a closely clipped reknotted would protrude beyond the surrounding pile. A patch reinforcement is sometimes used to strengthen a damaged area before kashmiring, particularly at the edges of a rug.

Small areas of loss are filled either by darning, plugging, or reweaving. Darning, which covers the hole with a plain-woven fill simulating warps and wefts, is the least successful technique. Frequently, the yarns of a darn are bulky to compensate for both the loss of foundation and depth of pile.

Plugs — segments cut from other rugs,

Fig. 1. Stem stitch embroidery has been used to fill in worn areas in the field of this carpet. This stitching, or "kashmiring," is most evident in the light area to the right of the palmette.



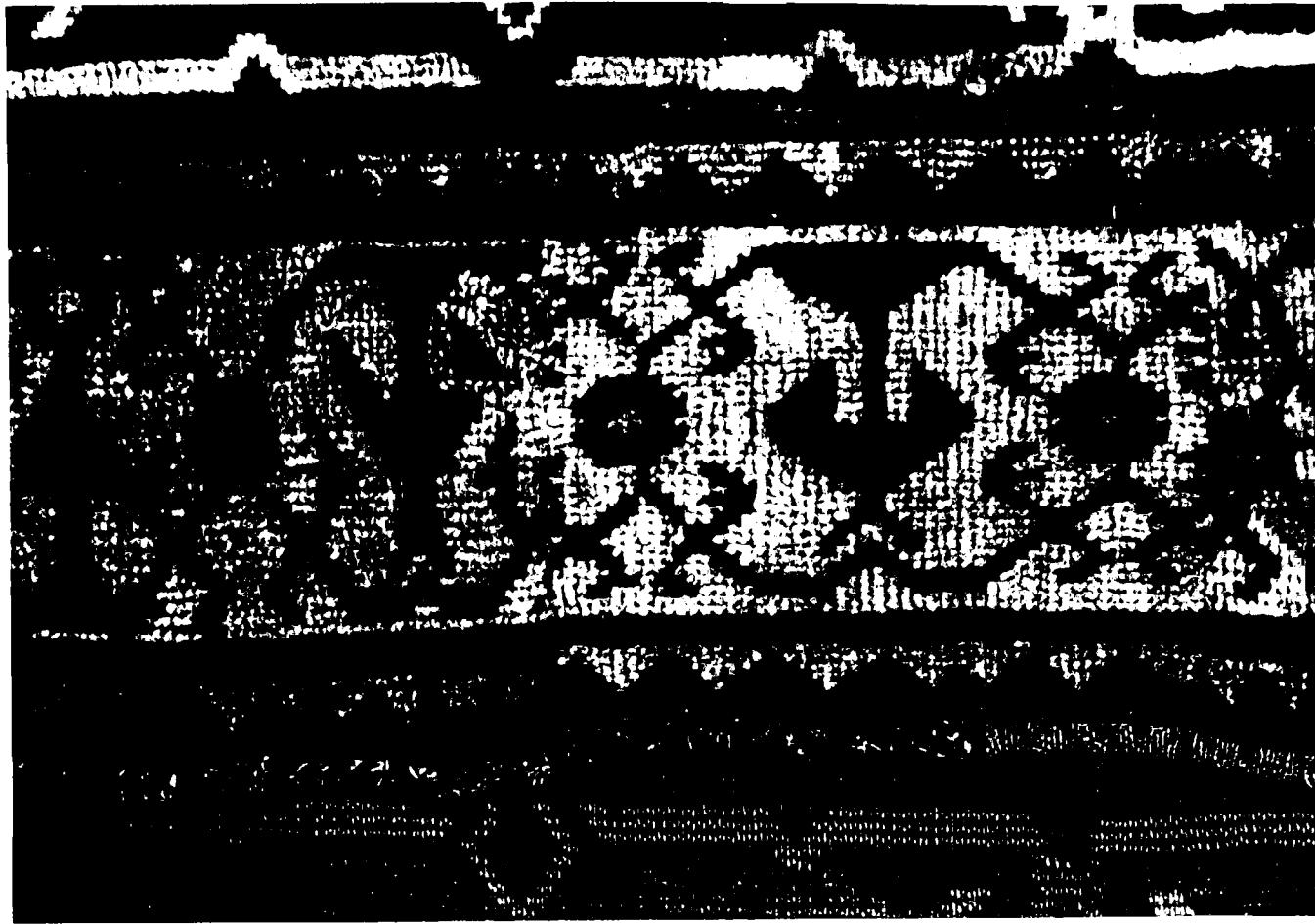


Fig. 2. The right half of the border in this photograph is a "plug" cut from another carpet and inset into this rug. The obvious difference in texture results from the warps and wefts of the plug having been set in perpendicular to the warps and wefts of the rug.

or cannibalized from the rug's own borders and sewn into place — do their greatest service to structurally reinforce the rug. However, they often clash with the rug's original design and colors. If matched well in color and knot density, the effect may not be terribly disturbing from a distance. Even if the design is well matched, it may be at the sacrifice of the texture of pile direction as in figure 2, where the warps and knots of the plug have been inserted perpendicular to the direction of the rug's warps and knots.

Unlike darning and most types of plugs, when reweaving is done well it can produce a fill which is almost undetectable from the original. However, in many instances, poor color choice or fading of replacement yarns over the years can render an unsuitable result (fig. 3). And, depending on the fineness of the rug's elements and the skill of the person executing the repair, the insertion of new warps, wefts, and knots into a brittle rug may result in further damage (fig. 4).

For larger areas of loss, a combination of reweaving and plugging often has been done, again with the same potential for color change

and damage to original elements where new yarns are introduced. A detail from a Caucasian dragon carpet shown in figure 5 has been heavily plugged with large pieces woven from the same design as the original.⁸

Conservation Treatments

Having surveyed techniques used historically, conservation literature was also reviewed to see which treatments might be applicable to both stabilize and aesthetically compensate for loss in rugs. In evaluating both traditional and conservation treatments, it was felt that the visual effect of good reweaving was the most effective treatment available, but that the introduction of new warps and wefts into an already fragile structure would potentially cause further damage. Further, a reweave is not easily removed.⁹ The technique of laying in a continuous warp with needle and thread (fig. 6) also was briefly considered but rejected because of the potential for damage. Even using a fine thread to butt the new warp against the damaged edge, the needle must travel

through each original warp location twice in order to attach the new warp in place. It was felt that any future need to remove the fill might cause severe stress to the fragile yarns surrounding the repair.

A treatment developed for compensation for loss in tapestry by Leslie Smith¹⁰ appeared to be adaptable to either pile rugs or flatweaves. A hole in a medieval tapestry was visually very glaring because the loss was to the face of the main figure in the design. A flat fabric patch to stabilize the area served only to accentuate the problem. Not wanting to reintroduce new warps into the tapestry and reweave the missing area, a one-to-one photograph was taken, and Smith recreated the design for the missing area on the photo. This photo became the cartoon for weaving a new fill patch. After the old fabric fill was removed, the newly woven patch was inlaid with needle and thread.

It was determined that a newly woven plug based on the technique for the medieval tapestry offered the most hope for consolidating holes in flatweaves and pile rugs. The variation to this technique which the authors expected to employ was to mount the woven plug on a cotton fabric patch, with the rationale that the extended patch could be attached to a stronger area of the rug and away from the fragile edges of the hole, thus providing greater support to the damaged area.

This technique for compensation for loss can be referred to as a "passive fill" since it is only attached to the rug between warps and wefts rather than through the structure. The fabric patch behind the plug acts as the consolidating element, since it is attached to the rug in a stronger location and away from the hole. The damaged edges of the rug are treated separately by stitching with a fine thread through the rug structure to stabilize loose knots, warps, and wefts. This insures that if the patch has to be removed in the future, there will not be the danger of causing further damage or loss to any original elements.

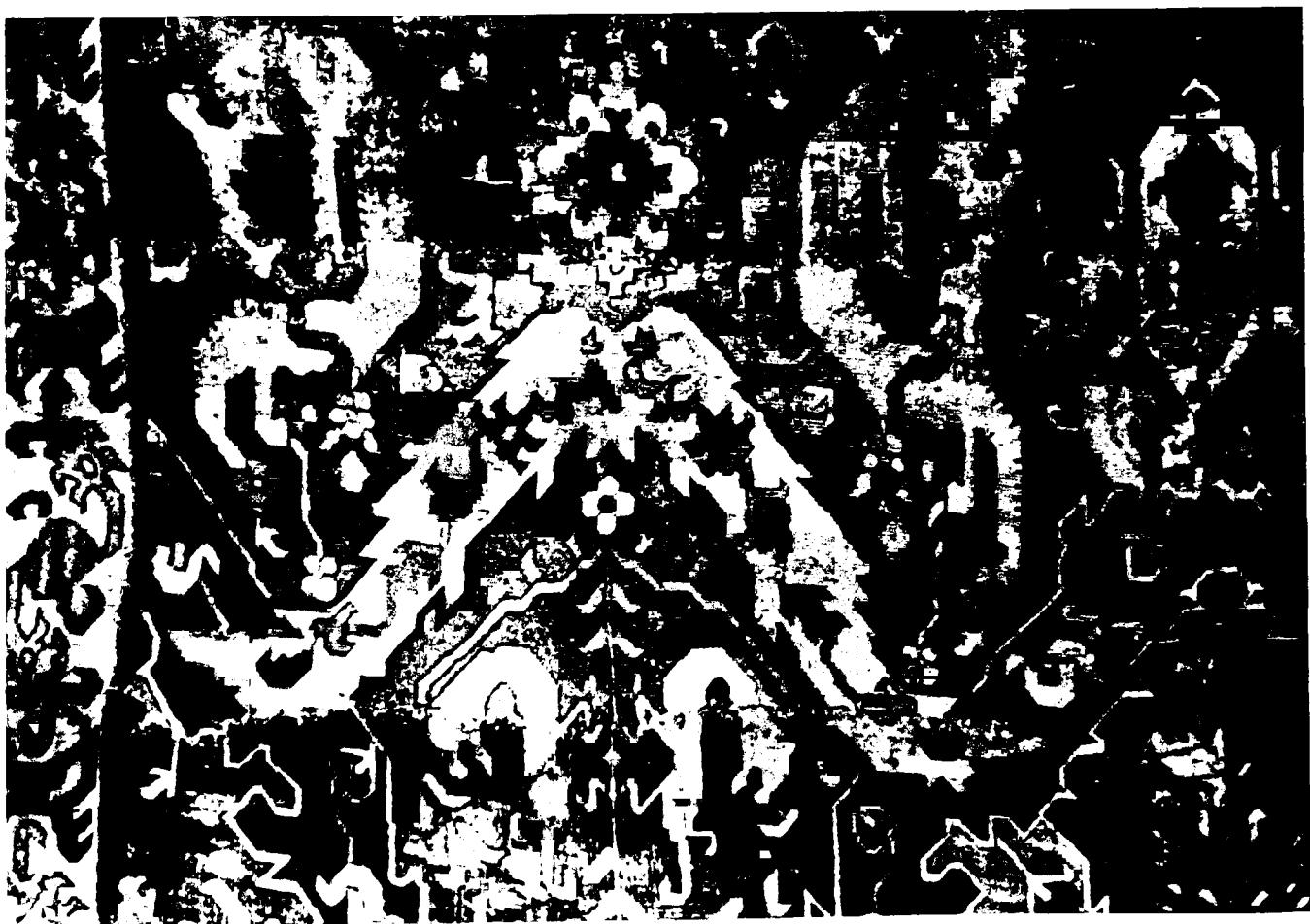
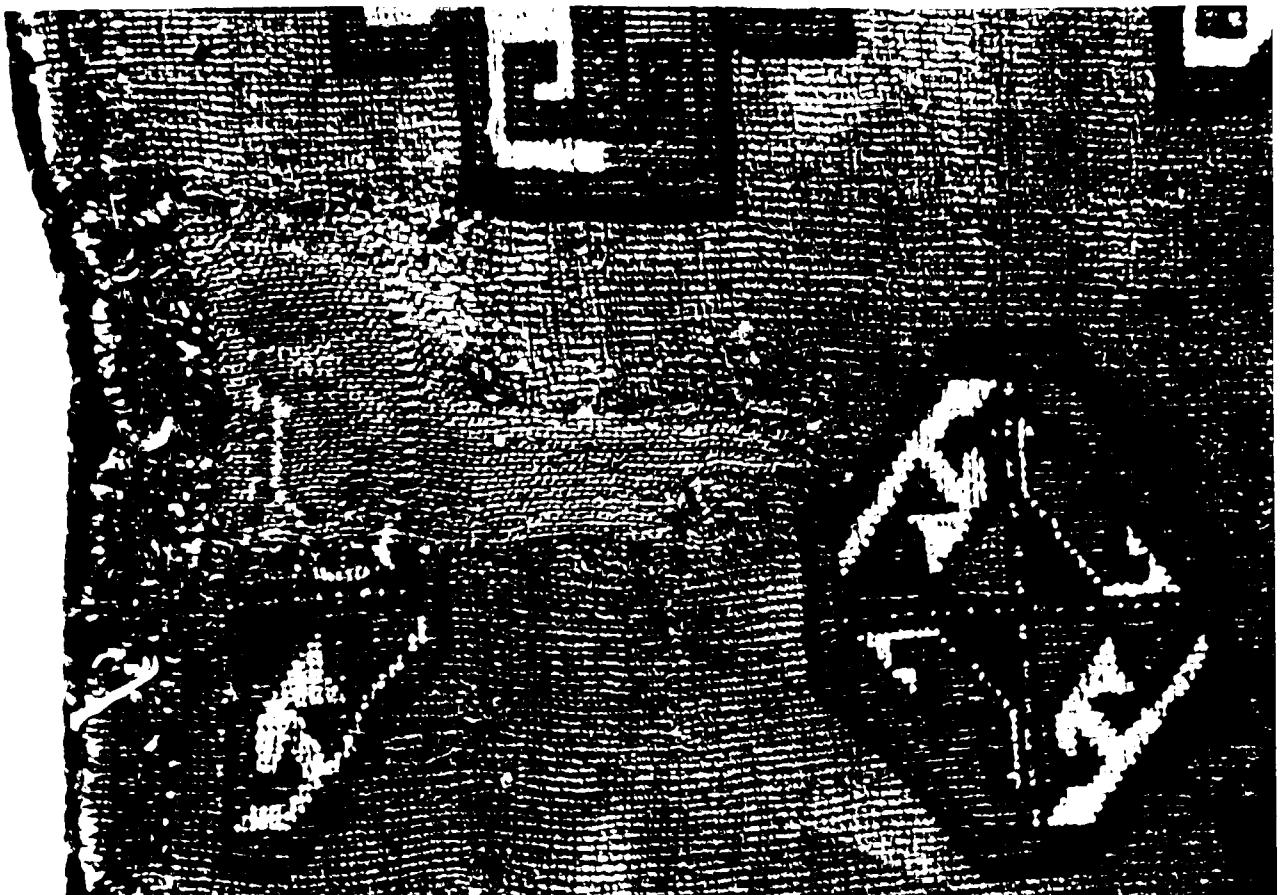
The piece selected for this treatment was a wool Turkish Milas prayer rug (fig. 7) measuring 60 inches in the warp direction by 43-3/4-inches in the weft direction. While in good overall condition, there were twelve existing repairs in the rug.

Reweaving had been done with a heavy white cotton warp, and reknotted with bright

red, pink, purple, and black wools. The added pile was high, lumpy, and inconsistent (fig. 8). The heavy cotton warp had moved to the rug's surface, breaking through original knots which then could be more easily lost. More important than the significant visual disturbance of the repair was the structural distortion of the surrounding areas, thereby endangering the basic stability of the rug (fig. 9). In short, the visual disparity and the negative structural effect of the repair method were considered sufficient criteria for removal of previous repairs and retreatment.¹¹

Fig. 3. The white, blotchy appearance in the field of this rug is due to the fading of replacement yarns used in reweaving.





Fine scissors and tweezers were used to cut and remove the unsightly reknots and replacement foundation without disturbing original elements. In order to stabilize the original yarns against future loss, the edges of the hole were reinforced with a ladder stitch. Using a fine cotton thread and working from the back, the thread traveled up one warp, inside the knots, and down the adjacent warp. The points of entry and exit were varied to prevent a straight line of stress.

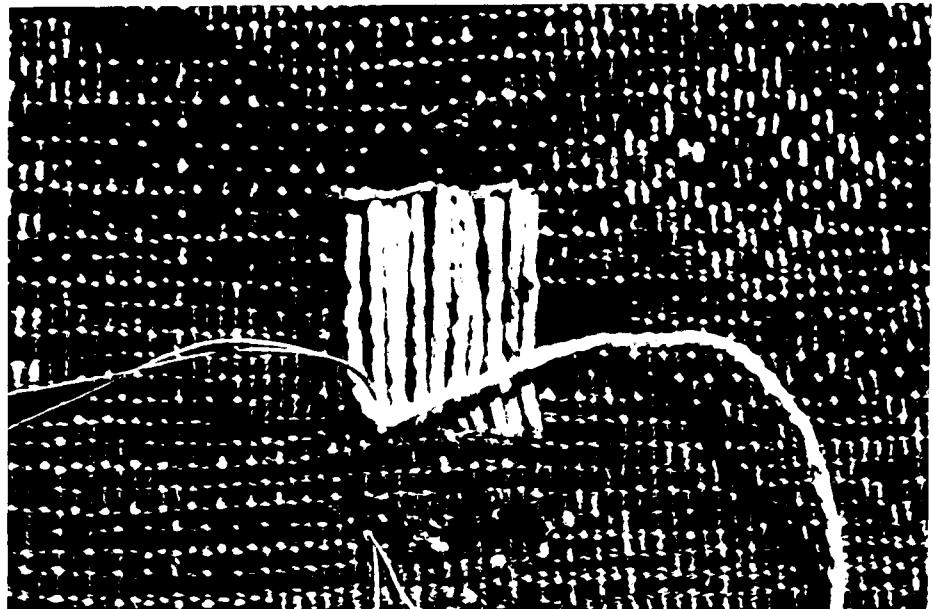
Using an overlay of 4 mil transparent mylar, an outline of the hole was drawn. The correct number of warps and wefts was also drawn on the template to use as a guide during weaving. A cartoon of the pattern of knots provided the guide for knotting and design. This was based on the other palmette designs in the rug, but since not one was identical to another or to the damaged palmette, it was impossible to replicate an existing pattern.

The choice of materials in all conservation treatments is paramount to the success of the work. Obviously, in the case of rug repair, the successful *selection* and *manipulation* of yarns is foremost in the viewer's appreciation of the design. This is not mere theory, but based on training and actual practice the authors gained as apprentices in commercial carpet ateliers where they learned the principles of traditional carpet restoration.

The objective of the pilot project was to focus on the development of a viable method of treatment, not the selection of materials for treatment. Therefore, the decision was made to use readily available commercial wools.

Fig. 4, (top left). The rewoven area has distorted the surrounding original portion of the rug because the warps, wefts, and knots of the reweave are slightly larger than those of the original.

Fig. 5, (bottom left). Detail of a Caucasian dragon carpet (TM R36.1.1). The colors have faded significantly on this large plug.



The warp selected was a Navajo 2-ply, natural colored wool, chosen for its weight, hardness, and lack of fuzziness. It was given a harder twist with added spinning, wetting the yarn to secure the twist. All three colors for the knots and weft, red, brown, and yellow-orange, were Paternayan embroidery wools. The wool for the pile was unplied and then re-plied to avoid a twisted effect and to enable the mixing of colors.

The weaving of the plug was done on an artist's stretcher frame. Twenty-three warps were replaced and extra warps were added to each side to give the plug additional stability.

For the symmetrical knots, four to five strands of wool were plied together. The weft was treated as discontinuous, single strands. Once woven and knotted, the pile was trimmed using angled rug shears. When completed, the plug appeared perfect; however, it became apparent quickly that there was a serious flaw: the plug was too big. The knots were not pulled tightly enough, so when a new plug was woven, the warps would need to be placed closer together. In addition, the wool used for the knot had been plied with too many strands, causing the patch to be too large by approximately 1/4-inch in both directions. Further, the yellow-orange ground color appeared to be too dark after it had been trimmed, and the red and brown color sequence of the chevrons had inadvertently been reversed.

In weaving the second plug, only three

Fig. 6. A continuous warp can be inserted into a hole in a rug using a fine thread to butt the new warp against the damaged edge. The needle and thread must pass through each column of knots twice to secure the new warp in place.



strands of wool were plied together using a slightly lighter ground shade. A continuous weft was used to provide more stability to the edges which would be used in anchoring the plug to a support patch.

The completed plug was cut off of the loom, leaving four rows of single cotton leader on one end, and four shots of red weft on the other. It was then stitched with cotton thread onto a square of pre-washed cotton fabric. The stitch which was executed between each knot at the edge and which covered two warps served both to attach the patch to the fabric support and to further secure the edge of the knotted plug.

Next, the patch was inserted into the hole, warps of the rug and plug were aligned, and the patch was temporarily basted in place to the rug (fig. 10). The exposed warp ends and wefts of the rug around the hole were turned to the back of the rug to make the join smoother. A figure-eight stitch (see Ennes, fig. 11) was then used to join the carpet and patch. This stitch was chosen because of its ability to butt two edges, and because the stitch passes between, rather than through, the elements of the rug and patch. Two original loose weft threads still attached to the carpet were couched down over exposed and damaged warp ends to create a smoother visual transition between carpet and plug. Finally, the plug was lightly steamed to relax and flatten it. While the planar disparity between the carpet and patch was hardly discernible, it was hoped that steaming would give a greater illusion of continuity.¹²

Conclusion

An objective critique of this treatment is requisite for it to be considered for future application. Overall, the technique developed for implementing this "passive fill" was

Fig. 7. This Turkish Milas prayer rug (TM 1971.23.30) was chosen for treatment because of the disfiguring rewoven areas in the lower left palmette enclosed within the central field.

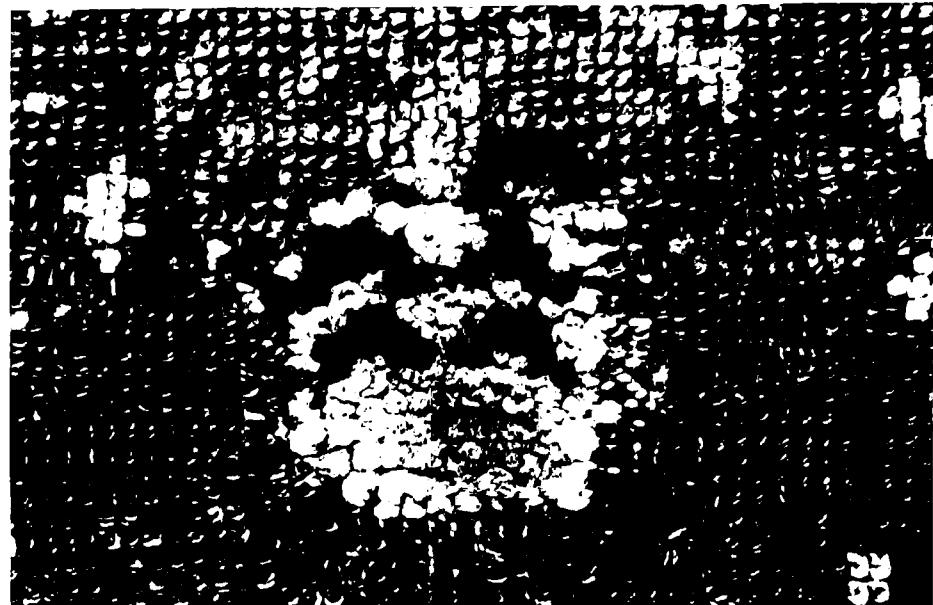


Fig. 8. Detail of the lower edge of the palmette (TM 1971.23.30). The reweoven pile in bright colors of wool was higher than the surrounding original pile.

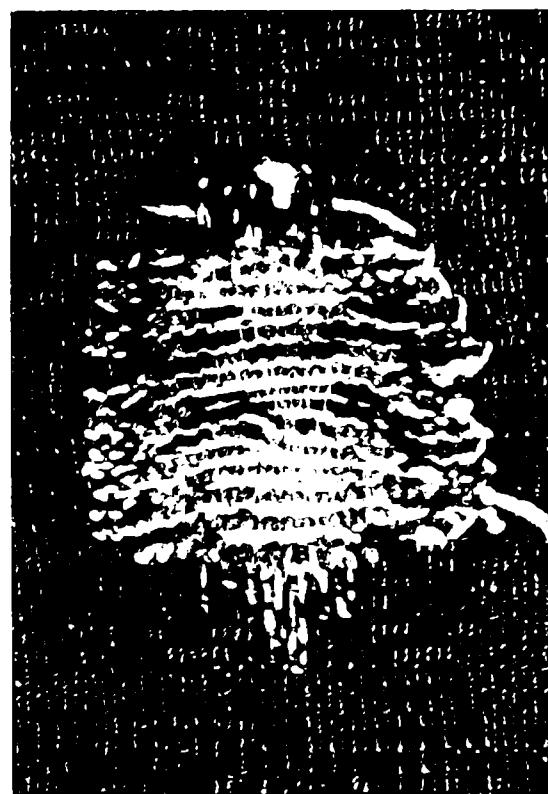


Fig. 9. Detail of the lower edge of the palmette from the rear (TM 1971.23.30). The heavy cotton warp of the reweave caused structural distortion to the surrounding original areas of the rug.

Fig. 10. The newly woven plug attached to its cotton support fabric was set into the hole and temporarily secured with large basting stitches which are clearly visible in this photograph. A figure-eight stitch was then used to join the carpet and plug.



Color and textural matching using commercially available yarn was the least successful aspect of this pilot treatment. Considering the availability of raw materials it should be possible to provide a close match of wool type. Custom dyeing to match the original colors should be considered a necessity.

The structural stability of the plug has not been fully resolved. In a pile medium in particular, the edges of a plug are vulnerable and must be well secured. While the support cloth and use of weft leaders act to stabilize the fill, a possible improvement would be

the use of a finer yarn, tightly packed, for the leader.

Finally, the visual integration of the patch into the rug is a concern. The transition between original knots and the new fill is difficult to achieve, even using traditional rug reweaving techniques in which a distorted and irregular hole is often trimmed back into a stronger area, or even squared off. While basic ethics of conservation prohibit such an approach, the worn circumference of the hole is left in marked visual juxtaposition to the newly woven fill.

There are two remaining challenges to

the success of this treatment. First, the technique needs to be refined and improved to be adaptable to a variety of rug structures. Second, the viewer will be the ultimate judge as to whether this technique provides an adequate aesthetic compensation for loss in Oriental rugs.

About the Authors

Sara Wolf Green has been Conservator at The Textile Museum since January 1988. She completed her M.A. degree in Special Studies (Ethnographic and Archaeological Conservation) at George Washington University in 1976, and she has worked in the conservation field since that time at the Smithsonian Institution, the Fiji Museum, and Texas Memorial Museum at the University of Texas at Austin. Mrs. Green is a Fellow of the American Institute for Conservation of Historic and Artistic Works and is widely published in the areas of ethnographic and textile conservation.

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Notes

1. The individuals interviewed provided instruction in traditional carpet repair and restoration techniques, and they provided examples and the commercial vocabulary for these techniques.
2. Within The Textile Museum's collection, no examples of adhesive or latex treatments were discovered, although these were abundant in the commercial sector.
3. In addition to needle and thread and adhesive treatments, paints and inks have been used to "retouch" faded colors or "correct" the colors of reknitting, or sometimes the entire field of a rug. Because such treatments would not be considered ethical by conservation standards, they were not included in the survey of historical treatments that could be considered in this project.
4. "The Romance of the Oriental Rug," *The Craftsman* 25, no. 6 (March 1914): 616-17.
5. Mira Edson, "Keeping Rugs in Repair," *American Homes and Gardens* 8, no. 12 (December 1911): v-viii.
Arthur Urbane Dilley, "The Essentials of Oriental Rugs," *The New Country Life* 33, no. 1 (November 1917): 27-38.
6. The Textile Museum core files: "Beshir Galleries."
7. Several embroidery stitches have been documented in The Textile Museum collections including stem stitch (which resembles cicim) and feather stitch. See Mrs. Archibald Christie, *Samplers and Stitches* (London: B.T. Batsford, 1920).
8. See also the cover photograph which clearly shows the faded plugs and reknots as a lighter color of red.
9. The Code of Ethics and Standards of Practice of the American Institute for Conservation of Historic and Artistic Works (AIC) states, "The conservator is guided by and endeavors to apply the 'principle of reversibility' in his treatments. He should avoid the use of materials which may become so intractable that their future removal could endanger the physical safety of the object. He should also avoid the use of techniques the results of which cannot be undone if that should become desirable." American Institute for Conservation of Historic and Artistic Works, 1990-91 Directory (Washington, D.C.: AIC, 1990), 22. Because textiles can undergo several treatments through time, as, for example, the fashion of

mounts change or more stable and long-lasting materials used in treatments are discovered, a piece should be re-treatable without jeopardizing the integrity of the original.

10. Leslie M. Smith, "The Exception to the Rule: Conservation of a Tapestry Fragment," *Textile History* 15, no. 2 (1984): 209-18.

11. The priority and criteria for treatment arrived at by the conservators and Curator Carol Bier were (1) that previous repairs cause structural damage or distortion to the rug; and (2) that the visual disturbance of the old repair precludes the rug's display.

12. Steaming was not considered to be harmful to the surrounding yarns.

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